REMARKS/ARGUMENTS

This reply is fully responsive to the Office Action dated 26 NOVEMBER 2008, and is filed within FIVE - (5) months following the mailing date of the Office Action. The Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136(a) requesting an extension of time of the number of months necessary to make this response timely filed. The method of payment and fees for petition fee due in connection therewith is enclosed.

Disclosure/Claims Status Summary:

This application has been carefully reviewed in light of the Office Action of November 26, 2008, wherein:

A. Claims 18-28 and 32-42 are objected to as reciting "means for" according their meaning as per 35 U.S.C. § 112, sixth paragraph, and not according the meaning as per paragraph [54] of the specification of the instant application;

B. Claims 1-42 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention; and

C. Claims 1-42 were deemed allowable over the prior art of record at this time, pending resolution of the rejections noted above.

Claims Objections

A. In Section 2. ii) of the Office Action, the Examiner objected to Claims 18-28 and 32-42 as reciting "means for" according their meaning as per 35 U.S.C. § 112, sixth paragraph, and not according the meaning as per paragraph 54 of the specification of the instant application. The Examiner requested that the Applicants map the "means for" recitations in Claims 18-28 and 32-42 to the specification of the instant application, specifically to the definition in paragraph [54] of the specification of the instant application.

Claims 18-28 and 32-42

The Applicants submit that the Applicants are entitled to be their own lexicographer and the language provided in paragraph [54] of the specification is precisely provided to obviate the issue as presented by the Examiner. Nevertheless, Claims 15, 18-29, and 32-42 have been amended as follows to further clarify the issue. It should be noted that the claims do NOT include "means for" language and instead include "means" that are stored on a compute readable medium for causing a set of operations to be performed by the computer.

Therefore, in accordance with the Examiner's request, the Applicants have amended the preamble of the independent Claims 15 and 29 to reflect the meaning of "means" as per paragraph [54] of the specification of the instant application, wherein the Apparatus Claims 18-28 depend from independent Claim 15 and the Computer Program Product Claims 32-42 depend from independent Claim 29.

The Applicants submit that paragraph [54] of the specification of the instant application reads as follows:

> [54] Means - The term "means" as used with respect to this invention generally indicates a set of operations to be performed on a computer, and may represent pieces of a whole program or individual, separable, software modules. Non-limiting examples of "means" include computer program code (source or object code) and "hard-coded" electronics (i.e. computer operations coded into a computer chip). The "means" may be stored in the memory of a computer or on a computer readable medium.

The Applicants believe that the meaning accorded by paragraph [54] above to the term "means" is equivalent to "a set of operations to be performed on a computer," as stated above in the second line of paragraph [54]. The Applicants further believe that "a set of operations to be performed on a computer" is equivalent to "a processor that is operable for performing operations of." Therefore, the Applicants have amended out of the claims the term "means

for" and substituted "means for" with the term "operations of," in order to map the "means for" recitations in the claims to the meaning accorded by the specification of the instant application, as suggested by the Examiner.

Accordingly, the Applicants currently amended the preamble of independent Claim 15 to read as follows:

> An apparatus for simulating a time-domain response of a mixed-signal system comprising a data processing system, the data processing system having a processor and a memory coupled with the processor, wherein the memory includes means that are executable by the processor for causing the processor to perform operations of:

Furthermore, the Applicants currently amended the preamble of independent Claim 29 to read as follows:

> A computer program product for simulating a time-domain response of a mixed-signal system, the computer program product comprising computer-readable means stored on a computer-readable medium that are executable by a computer having a processor for causing the processor to perform the operations of:

In addition, in accordance with the independent claim amendments presented above for Claims 15 and 16, the Applicants amended the dependent Claims 18-28 and Claims 32-42 to reflect the term "operation of" instead of the term "means for." The Applicants further refer the Examiner to pages 2 to 11 of this current response for a complete listing of the current amendments to all the claims of the present invention.

The Applicants submit that all the amendments above are supported by the language in the specification and have an acceptable meaning of the disclosure as per paragraph [54] of the specification of the instant application. These amendments are simply additional specific statements of inventive concepts described in the application as originally filed.

The Applicants further submit that the current amendments to the term "means for" in Claims 15, 18-29, and 32-42, satisfy the current standards for 35 U.S.C. § 101 released on October 30, 2008 by the USPTO via an opinion letter directed to Section 101 and statutory subject matter and changes in the standard from the "useful, concrete and tangible result" inquiry into the "machine-or-transformation test."

Therefore, the Applicants respectfully request that the Examiner accept the newly amended set of claims as a replacement for the original set of claims submitted with the patent application. The Applicants believe this new set of amended claims overcome the objections cited by the Examiner during the Office Action, dated November 26, 2008.

Claim Rejections - 35 U.S.C. § 112, second paragraph

B. In Section 4 of the current Office Action, the Examiner rejected Claims 1-42 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claims 1, 15, and 29

In the first part of Section 4-i) of the current Office Action, the Examiner stated that independent Claims 1, 15, and 29 recite "a large number of clock cycles," and that the Applicants have not provided a range of clock cycles, such as >=100 or >=1000, so it is impossible for the Examiner to ascertain the scope, metes, and bounds of "large number or clock cycles," wich renders the claims vague and indefinite.

RESPONSE to Section 4-i:

In order to elicit an early allowance and to avoid any further confusion regarding what constitutes "a large number of clock cycles," as used throughout this patent application, the Applicants have amended independent Claims 1, 15, and 29 to include an approximate bound on the minimum number of clock cycles which constitute "a large number of clock cycles" as disclosed by the present invention.

Therefore, the Applicants refer the Examiner to the currently amended independent Claims 1, 15, and 29, wherein the Applicants have amended the claims to include the statement "wherein the large number of clock cycles is approximately greater than sixteen thousand three hundred and eighty four clock cycles.". The amendments to these claims are supported by the language in the specification and have an acceptable meaning of the disclosure. These amendments are simply additional specific statements of inventive concepts described in the application as originally filed.

The Applicants submit that support for the current amendments to Claims 1, 15, and 29 regarding an "large number of clock cycles" can be found in the original patent application in paragraphs [30], [61], [66], and [94], and specifically in page 16, lines 17 and 21, where the specification specifically states that "a complete simulation typically requires 2^{14} or more clock periods ... the time is amortized over 2^{14} or more clock cycles." The Applicants emphasize that 2^{14} is mathematically equal to sixteen thousand three hundred and eighty four.

In the first part of Section 4-ii) of the current Office Action, the Examiner stated that independent Claims 1, 15, and 29 recite "weakly non-linear," and that although the Examiner recognizes this to be a term in the art, the Examiner believes that the Applicants have not provided adequate specificity with respect to the determination of the scope, metes, and bounds of weakly linear in conjunction with the clock periods as recited in the claims and this renders the claims vague and indefinite.

RESPONSE to Section 4-ii:

The Applicants believe that the statement "calculation within each clock period is weakly non-linear" corresponds to standard terminology used by a person of ordinary skill in the art of signal processing while referring to techniques for simulating a time-domain response of a mixed-signal system, and as such, there should be no need to further specify the detailed steps of how a weakly non-linear calculation is performed.

However, in order to elicit an early allowance and to avoid any further confusion regarding what constitutes "weakly non-linear calculation within each clock period," as used throughout this patent application, the Applicants have amended independent Claims 1, 15, and 29 to include a detailed description of what constitutes a "weakly non-linear calculation," as disclosed by the present invention.

Therefore, the Applicants refer the Examiner to the currently amended independent Claims 1, 15, and 29, wherein the Applicants have amended the claims to further include the following description:

> "wherein the weakly non-linear calculation utilizes a linearity measure of approximately less than 50% of a linear portion of the mixed signal system."

The amendments to these claims regarding the "weakly non-linear calculation" are supported by the standard terminology used by a person of ordinary skill in the art of signal processing while referring to techniques for simulating a time-domain response of a mixed-signal system, as well as by the language in the specification, and as such, have an acceptable meaning of the disclosure. These amendments are simply additional specific statements of inventive concepts described in the application as originally filed.

In the first part of Section 4-iii) of the current Office Action, the Examiner respectfully requested that the Applicants clarify the separation in the language of the claims specifically between the second limitation reciting "selecting..." and the third limitation reciting "iteratively applying...."

RESPONSE to Section 4-iii:

In order to elicit an early allowance and to avoid any further confusion regarding what constitutes "iteratively applying the wavelet-based matrix operator within each clock period" compared with "sequentially over a large number of clock cycles" to calculate a time domain response of the mixed signal system," as stated in the previously submitted claims and as

used throughout this patent application, the Applicants have amended independent Claims 1, 15, and 29 to separate more clearly the "iterative act" from the "sequential act" and to avoid any further confusion regarding the "separation of the time domain response of the system as a whole and its subset of clock periods and cycles."

Therefore, the Applicants refer the Examiner to the currently amended independent Claims 1, 15, and 29, wherein the Applicants have amended the claims to include the act of "breaking up a mixed-signal system simulation into clock periods" to specifically define the "separation of the time domain response of the system as a whole and its subset of clock periods and cycles."

In addition, **in order to emphasize the distinction between the two separate acts of** "sequentially calculating a time-domain response over a large number of clock cycles" and "iteratively applying the wavelet-based matrix operator within each clock period," the Applicants further amended the independent claims by restructuring the "act of iteratively applying the wavelet-based matrix operator with each clock period" as follows:

> calculating a time-domain response of the mixed signal system by performing sequentially over a large number of clock cycles an act of:
>
> iteratively applying the wavelet-based matrix operator within each clock period, wherein the large number of clock cycles is approximately greater than 2E14 (sixteen thousand three hundred and eighty four) clock cycles and calculation within each clock period is weakly non-linear, and wherein the calculation within each clock period is performed by matrix multiplication ...

The amendments to these claims are supported by the language in the specification and have an acceptable meaning of the disclosure. These amendments are simply additional specific statements of inventive concepts described in the application as originally filed.

The Applicants submit that support for the amendments above to Claims 1, 15, and 29 can be found in the original patent application in paragraphs [30], [61], [66], and [94]. Specifically, support for the amendment for the act of "breaking up a mixed-signal system simulation into clock periods" is found in the specification in paragraph [61], page 16, lines 9 to 10, where the specification states that "the present invention provides a technique in which a system simulation is broken up into clock periods ..."

The amendments provided above regarding the restructuring of the acts of "sequentially calculating a time-domain response over a large number of clock cycles" and "iteratively applying the wavelet-based matrix operator within each clock period," are supported by the standard terminology used by a person of ordinary skill in the art of signal processing while referring to techniques for simulating a time-domain response of a mixed-signal system, as well as by the language in the specification, and as such, have an acceptable meaning of the disclosure. These amendments are simply additional specific statements of inventive concepts described in the application as originally filed.

The Applicants emphasize that all of the amendments presented above in this response are simply additional specific statements of inventive concepts described in the application as originally filed. Some of these amendments have been made to increase claim readability, to improve grammar, and to reduce the time and effort required of those skilled in the art to clearly understand the scope of the claim language.

Furthermore, all the amendments presented in this response are made for clarification and in order to elicit an early allowance, and do not change the scope of the claims. Thus, the Applicants assert that these amendments do not create prosecution history estoppel under the standard set forth in *Festo*, and should be afforded the benefit of the judicially created doctrine of equivalents. See *Festo*, 520 U.S. 1111 (1997).

Therefore, the Applicants respectfully request that the Examiner accept the currently amended set of claims as a replacement for the original set of claims submitted with the

patent application. The Applicants believe that the new set of amended claims overcome the rejections cited by the Examiner under 35 U.S.C. § 112, second paragraph.

In light of these amendments and the remarks made above, the Applicants believe Claims 1-42 to be allowable in their newly amended form, and respectfully request that these rejections of Claims 1-42 under 35 U.S.C. § 112, second paragraph, be withdrawn.

Dependent Claims

Claims 2-14 are dependent upon Claim 1, Claims 16-28 are dependent upon Claim 15, and Claims 30-42 are dependent upon Claim 29. In light of the current amendments and for at least the reasons given above, the Applicants submit that Claims 1, 15, and 29 are patentable over 35 U.S.C. § 112, second paragraph. Therefore, in addition to the reasons set forth above, the Applicants submit that Claims 2-14, 16-28, and 30-42 are also patentable over 35 U.S.C. § 112, second paragraph at least based on their dependence upon an allowable base claim and in light of the amendments currently presented in this response.

Allowable Subject Matter

C. In Section 5 of the current Office Action, the Examiner deemed allowable Claims 1-42 over the prior art of record.

The Applicants thank the Examiner for his acknowledgement that Claims 1-42 are deemed allowable over the prior art of record at this time, pending resolution of the Applicants clarifying the range of "large number of clock cycles" as well as "weakly non-linear," and as well as distinctly defining the separation of the time domain response of the system a as a whole and its subset of clock periods.

In accordance with the Examiner's acknowledgment of allowable subject matter, the Applicants have amended the claims to place them in order for allowance. Therefore, the Applicants submit that all pending Claims 1-42 are now in order for allowance.

Closing Remarks:

The Applicants respectfully submit that, in light of the above amendments/remarks, the application and all pending claims are now in allowable condition. Therefore, reconsideration is respectfully requested. Accordingly, early allowance and issuance of this application is respectfully requested.

Any claim amendments that are not specifically discussed in the above remarks are not made for patentability purposes, and it is believed that the claims would satisfy the statutory requirements for patentability without the entry of such amendments. Rather, these amendments have only been made to increase claim readability, to improve grammar, and to reduce the time and effort required of those skilled in the art to clearly understand the scope of the claim language. Furthermore, any new claims presented above are of course intended to avoid the prior art, but are not intended as replacements or substitutes of any cancelled claims. They are simply additional specific statements of inventive concepts described in the application as originally filed.

Further, it should be noted that amendment(s) to any claim is intended to comply with the requirements of the Office Action in order to elicit an early allowance, and is not intended to prejudice Applicant's rights or in any way to create an estoppel preventing Applicant from arguing allowability of the originally filed claim in further off-spring applications.

In the event the Examiner wishes to discuss any aspect of this response, or believes that a conversation with either Applicant or Applicant's representative would be beneficial, the Examiner is encouraged to contact the undersigned at the telephone number indicated below.

The Commissioner is authorized to charge any additional fees that may be required or credit overpayment to the attached credit card form. In particular, if this response is not timely filed, the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136(a) requesting an extension of time of the number of months necessary to make this response timely filed. The petition fee due in connection

therewith may be charged to deposit account no. 50-2691 if a credit card form has not been included with this correspondence, or if the credit card could not be charged.

Respectfully submitted,

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